

#8/2d3

Our Case No. 659/866
K-C Ref. No. 13,308.1

In re Application of:

Examiner Peter Chin

Group Art Unit No. 1731

For SOFT HIGHLY ABSORBENT
PAPER PRODUCT CONTAINING
KETENE DIMER SIZING AGENTS

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BOARD OF PATENT APPEALS
AND INTERFERENCES

This is an appeal from the Final Rejection dated July 17, 2002, of Claims 1-22, all the claims pending herein.

(1) REAL PARTY IN INTEREST

The present application is owned by Kimberly-Clark Worldwide, Inc.

(2) RELATED APPEALS AND INTERFERENCES

There are no known appeals or interferences, which will directly affect or be directly affected by or have a bearing on this appeal.

(3) STATUS OF CLAIMS

Claims 1-22 are pending herein, and all are appealed.

(4) STATUS OF AMENDMENTS

A Request for Reconsideration on was filed April 26, 2001 [Paper No. 5] after Non-Final Rejection. The Final Rejection of July 17, 2002 [Paper No. 6], indicates that this Request for Reconsideration was considered. Thus, the claims are in the form as referred to in the Final Rejection of July 17, 2002.

(5) SUMMARY OF INVENTION

In an embodiment of the invention, there is provided a soft highly absorbent tissue product comprising long paper making fibers (p. 6, line 6), a surface active agent (p. 4, line 24 – p. 5, line 3), and a ketene dimer sizing agent (p. 4, lines 3-12).

In another embodiment of the invention, there is provided a soft absorbent paper tissue product comprising paper making fibers (p. 6, lines 6-13) and at least about 1 pound of a ketene dimer sizing agent per ton of paper product (p. 11, lines 1-10), the tissue having an absorbency rate of less than about 10 seconds (p. 10, lines 11-17).

In yet another embodiment of the invention, there is provided a soft absorbent tissue sheet comprising a first layer and a second layer (p. 6, lines 14-17), the first layer comprising predominately long paper making fibers (p. 6, line 6) and the second layer

comprising predominantly short paper making fibers (p. 6, line 7); at least one of the layers further comprising a ketene dimer sizing agent and a surface active agent (p. 4, lines 3-12 and line 24 – p. 5, line 3); and the layer comprising the ketene dimer and surface active agent being wettable by water (p. 7, lines 22-29).

In yet another embodiment of the invention, there is provided an absorbent paper sheet having improved softness comprising a first sheet surface and a second sheet surface (p. 6, lines 14-17); a layer comprising paper making fibers (p. 6, lines 6-13), the layer having a surface, the surface of the layer corresponding to a surface of the paper sheet (p. 6, lines 14-17), the surface of the layer having a ketene dimer sizing agent therein (p. 4, lines 3-12); the surface of the sheet having a surface active agent therein (p. 4, line 24 – p. 5, line 3); and the wettability of the sheet being equivalent to a sheet of the same composition but not having the ketene dimer sizing agent therein (p. 7, lines 22-27).

In yet another embodiment of the invention, there is provided an absorbent paper sheet having improved softness comprising cellulose paper making fibers (p. 6, lines 6-13) and a ketene dimer sizing agent (p. 4, lines 3-12) and a surface active agent (p. 4, line 24 – p. 5, line 3); the sizing of the sheet being no greater than about three times the sizing of a sheet of similar composition but not having the ketene dimer sizing agent and surface active agent (p. 7, lines 27-29).

In yet another embodiment of the invention, there is provided a method of making a soft highly absorbent paper sheet product having improved softness comprising: (a) forming an aqueous slurry comprising paper making fibers in a pulper (p. 5, lines 4-7); (b) combining a the ketene dimer sizing agent with the paper making fibers (p. 6, lines 18-27); (c) combining a surface active agent with the paper making fibers (p. 6, lines 27-32); and (d) removing the water from the aqueous slurry (p. 5, lines 16-20).

In yet another embodiment of the invention, there is provided a soft highly absorbent paper product comprising a blended base sheet (p. 6, line 16), a ketene dimer sizing agent (p. 4, lines 3-12), and a surface active agent (p. 4, line 24 – p. 5, line 3).

(6) ISSUE

- 1. Whether Claims 1-22 are obvious under 35 USC § 103 over U.S. Patent No. 2,996,424 to Voigtman et al. or over U.S. Patent No. 3,014,832 to Donnelly.**

(7) GROUPING OF CLAIMS

For the purposes of this appeal the claims do not stand or fall together. Claims 1, 4-17 and 21-22 are distinct from Claims 2-3, and both of these groups are distinct from Claims 18-20. Reasons why these groups of claims are separately patentable are given below.

(8) ARGUMENT

1. Description of the present invention

Appellants have developed a paper product that is both soft and highly absorbent. It has been discovered that the use of ketene dimer sizing agents in tissue and towel increases the softness of these products, and that wetting agents or surfactants can be used in conjunction with these sizing agents to eliminate sizing without eliminating the softness benefit. The addition of the wetting agent to the sheet prevents the sizing agent from materially affecting the wetability of the sheet, i.e., the sheet is not sized. Thus, the rate of water absorption and the total amount of water that a sheet softened with a ketene dimer sizing agent and wetting agent can absorb is not materially different from an equivalent sheet that does not have those agents. These sheets can have as much as a one to two fold increase in sizing compared to a sheet without the sizing agent, and still exhibit sufficient hydrophilicity. Thus, the increased softness benefits of the ketene dimer sizing agents are obtained without any material loss of water absorbitivity or hydrophilicity.

The pending claims that cover the present invention may be organized generally into three separately patentable groups. The first group, including Claims 1, 4-17 and

21-22, recites an absorbent sheet or product that includes both a surface active agent and a ketene dimer sizing agent. The second group, including Claims 2-3, recites an absorbent sheet including at least about 1 pound of a ketene dimer sizing agent per ton of paper product, where the paper product has an absorbency rate of less than about 10 seconds. The third group, including Claims 18-20, recites a method of making an absorbent sheet product including combining a ketene dimer sizing agent with paper making fibers and combining a surface active agent with paper making fibers.

The first and second groups are separately patentable as subcombinations usable together (MPEP 806.05(d)). A sheet or product including both a surface active agent and a ketene dimer sizing agent may be used in applications where an absorbency rate greater than about 10 seconds is permissible. The first and second groups are each separately patentable relative to the third group as process of making and product made (MPEP 806.05(f)). A sheet or product including a surface active agent and a ketene dimer sizing agent can be made by a materially different process, such as by applying a liquid containing a ketene dimer sizing agent and/or a surface active agent to a preformed sheet or product and evaporating the liquid.

2. Claims 1-22 are not obvious over U.S. Patent No. 2,996,424 to Voigtman et al.

The claims at issue stand rejected as obvious over U.S. Patent No. 2,996,424 to Voigtman et al. ("Voigtman"). Voigtman, however, does not teach or suggest each and every element of Appellants' claims, nor have these missing elements been supplied by another reference or by any other evidence. Specifically, Voigtman does not teach or suggest the elements of Appellants' claimed tissue product that recite the presence of both a surface active agent and a ketene dimer sizing agent, as in Claims 1, 4-17 and 21-22. Voigtman also does not teach or suggest the elements of Appellants' claimed tissue product that recite the presence of at least about 1 pound of a ketene dimer sizing agent per ton of paper product, where the paper product has an absorbency rate of less than about 10 seconds, as in Claims 2-3. In addition, Voigtman does not teach or suggest the elements of Appellants' claimed process of making a tissue product that

recite combining a ketene dimer sizing agent with paper making fibers, and combining a surface active agent with paper making fibers, as in Claims 18-20.

Voigtman describes the use of a release agent in the manufacture of creped tissue. The release agent is applied in a pattern to a tissue web on a Yankee drier (col. 4, line 45 – col. 5, line 46), and the web is then removed from the drier by a creping doctor blade (col. 5, line 47-67). The result is a tissue paper with differential creping, i.e. areas of coarse creping and areas of fine creping (col. 5, line 68 – col. 6, line 15). The release agent may be a ketene dimer (col. 7, line 13) and may be applied as an oil-in-water emulsion (col. 7, line 75 – col. 8, line 9 (Example I) and col. 8, lines 54-63 (Example II)). There is no teaching or suggestion to combine the ketene dimer or its emulsion with a separate surface active agent.

The Examiner has asserted that it is obvious to add a surface active agent to the ketene dimer release agent of Voigtman since:

It is well known and understood that ketene dimers are water insoluble and hydrophobic and require an emulsifier or surfactant to produce an emulsion. [Paper No. 4, p. 2]

The Examiner further asserts that:

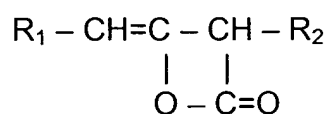
... it is especially obvious since it is standard and conventional practice in the art to add surfactants to tissue paper to improve softness and absorbency.
[Paper No. 4, p. 2]

These statements were not correlated with any references and were apparently provided from the Examiner's personal knowledge. In the Request for Reconsideration filed April 26, 2001 [Paper No. 5], Appellants requested an affidavit in support of these assertions based on the Examiner's personal knowledge, pursuant 37 CFR 1.104(d)(2).

With respect to the first assertion regarding the use of surfactants in ketene dimer emulsions, the Examiner has pointed to the references submitted in the Information Disclosure Statement, filed August 23, 2001 [Paper No. 3]. Specifically, the Examiner has presented U.S. Patent No. 4,861,376 to Edwards et al. ("Edwards") as an example of a reference disclosing the use of surfactants to form an emulsion with a

ketene dimer [Paper No. 6, p. 2]. The Examiner has, however, failed to provide any affidavit or references in support of the second assertion regarding the use of surfactants to improve softness and absorbency.

Appellants point out that Voigtman, Edwards, and the Examiner's personal knowledge, alone or in combination, do not teach or suggest each and every element of the claims. As noted in the "Description of the present invention" section above, the beneficial softness and absorbance as claimed by Appellants is due to the combination of a ketene dimer sizing agent and a surface active agent. A ketene dimer sizing agent includes the actual ketene dimer compound having the general structure



as well as other ingredients in the formulation, such as those described in the patents listed in the "Background" section of the specification (Specification, p. 4, lines 3-12; and p. 1, lines 4-28). This list of patents in the specification describing ketene dimer sizing agents includes the Edwards reference cited by the Examiner. Thus, any disclosure in these patents regarding preparing ketene dimer sizing agents by forming emulsions of ketene dimer compounds with surface active agents is insufficient to make obvious Appellants' claimed product or process. The surface active agent used by Appellants is separate from and in addition to any surface active agent that is included in the formulation of the ketene dimer sizing agent.

In Claims 1, 4-17 and 21-22, Appellants claim the combination of a ketene dimer sizing agent with a separate surface active agent. In Claims 18-20, Appellants claim both the combination of a ketene dimer sizing agent with paper making fibers and the combination of a surface active agent with the paper making fibers. The references and personal knowledge set forth by the Examiner are only directed to one of these elements, the ketene dimer sizing agent. The Examiner has not presented any references or other evidence that teach or suggest a combination of an additional surface active agent with a formulated ketene dimer sizing agent.

In Claims 2-3, Appellants claim a tissue product comprising a ketene dimer sizing agent in a concentration of at least 1 pound per ton, where the product has an

absorbancy rate of less than about 10 seconds. As noted in the specification, conventional tissue products containing this level of ketene dimer sizing agent, without a surface active agent as taught by Appellants, have absorbancy rates of at least 25 seconds (p 10, lines 5-17). Thus, the references and personal knowledge set forth by the Examiner cannot provide a tissue product having the claimed absorbance rate when containing at least 1 pound per ton of a ketene dimer sizing agent.

In view of the complete lack of evidence of any teachings or suggestions of each and every element of the claims, and further in view of the disclosure related to these elements in Appellants' specification, the present claims are not obvious under 35 USC § 103 over Voigtman.

3. Claims 1-22 are not obvious over U.S. Patent No. 3,014,832 to Donnelly.

The claims at issue stand rejected as obvious over U.S. Patent No. 3,014,832 to Donnelly ("Donnelly"). Donnelly, however, does not teach or suggest each and every element of Appellants' claims, nor have these missing elements been supplied by another reference or by any other evidence. Specifically, Donnelly does not teach or suggest the elements of Appellants' claimed tissue product that recite the presence of both a surface active agent and a ketene dimer sizing agent, as in Claims 1, 4-17 and 21-22. Donnelly also does not teach or suggest the elements of Appellants' claimed tissue product that recite the presence of at least about 1 pound of a ketene dimer sizing agent per ton of paper product, where the paper product has an absorbency rate of less than about 10 seconds, as in Claims 2-3. In addition, Donnelly does not teach or suggest the elements of Appellants' claimed process of making a tissue product that recite combining a ketene dimer sizing agent with paper making fibers, and combining a surface active agent with paper making fibers, as in Claims 18-20.

Donnelly describes the use of a release agent in the manufacture of creped tissue. The release agent is applied evenly to a tissue web as it passes between press rolls and a tail roll (col. 4, lines 26-30), and the web is subsequently transferred to a Yankee drier (col. 6, lines 51-64) and then removed from the drier by a creping doctor

blade (col. 6, lines 65-68). The result is a tissue paper web that can be released easily and reproducibly from a drier (col. 3, lines 6-27). The release agent may be an alkyl ketene dimer (col. 5, line 17), although the examples of using the release agents only involve mineral oil (Examples I and II, col. 8-9) or fatty acids (Example III, col. 9-10). There is no teaching or suggestion to combine the alkyl ketene dimer with a surface active agent.

The Examiner has asserted that it is obvious to add a surface active agent to the ketene dimer release agent of Donnelly. The arguments provided for this assertion are identical to those set forth for the rejection over Voigtman. Thus, the Examiner's arguments are based on Donnelly, the Edwards reference, and the assertions based on the Examiner's personal knowledge.

Appellants point out that Donnelly, Edwards, and the Examiner's personal knowledge, alone or in combination, do not teach or suggest each and every element of the claims. With respect to Claims 1 and 4-22, as discussed above with respect to Voigtman, the Examiner has not presented any references or other evidence that teach or suggest a combination of an additional surface active agent with the ketene dimer release agent of Donnelly. With respect to Claims 2-3, as discussed above with respect to Voigtman, the references and personal knowledge set forth by the Examiner cannot provide a tissue product having the claimed absorbance rate when containing at least 1 pound per ton of a ketene dimer sizing agent.

In view of the complete lack of evidence of any teachings or suggestions of each and every element of the claims, and further in view of the disclosure related to these elements in Appellants' specification, the present claims are not obvious under 35 USC § 103 over Donnelly.

4. Lack of motivation to modify U.S. Patent No. 2,996,424 to Voigtman et al. or U.S. Patent No. 3,014,832 to Donnelly.

The Examiner also has not provided any suggestion or motivation to provide a soft and highly absorbent paper product as recited in Appellants' claims. The arguments for obviousness rely on assertions that the individual elements of the claims

are known in standard practice [Paper No. 4, p. 2]. However, the Examiner has not provided any evidence of a suggestion to combine a ketene dimer sizing agent with an additional surface active agent, nor of any motivation to carry out such a combination. Likewise, the Examiner has not provided any evidence of a suggestion or motivation to provide a tissue product having the claimed absorbency rate when containing at least 1 pound per ton of a ketene dimer sizing agent, nor of any motivation to provide such a product. As noted in MPEP § 2143.01, with reference to *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993):

A statement that modifications of the prior art to meet the claimed invention would have been “well within the ordinary skill of the art at the time the claimed invention was made” because the references relied upon teach that all aspects of the claimed invention were individually known in the art is **not sufficient** to establish a *prima facie* case of obviousness without some **objective reason to combine** the teachings of the references. [Bold emphasis added]

This principle has been upheld in recent decisions of the U.S. Court of Appeals for the Federal Circuit. In the decision of *In re Dembiczak*, 50 USPQ2d 1614, 1618 (Fed. Cir. 1999), the court reversed a rejection under 35 U.S.C. § 103, stating:

Because we do not discern any finding by the Board that there was a **suggestion, teaching, or motivation to combine** the prior art references cited against the pending claims, the Board’s conclusion of obviousness, as a matter of law, cannot stand. [Emphasis added]

Likewise, in the decision of *In re Lee*, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002), the court reversed another rejection under 35 U.S.C. § 103, stating:

This factual question of motivation is material to patentability, and could not be resolved on **subjective belief** and **unknown authority**. [Emphasis added]

This same decision also addressed the need for substantive evidence rather than general statements of obviousness (*Ibid.*, 1435):

Thus when they [the examiner and the Board] rely on what they assert to be general knowledge to negate patentability, that **knowledge must be articulated and placed on the record**. ... The board **cannot rely on conclusory statements** when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies. [Emphasis and ellipsis added]

Thus, until the Examiner provides appropriate references or affidavits and some evidence of a motivation to combine a ketene dimer sizing agent with an additional surface active agent and/or to provide a tissue product having the claimed absorbency rate when containing at least 1 pound per ton of a ketene dimer sizing agent, a *prima facie* case of obviousness has not been presented.

Moreover, any assertion of obviousness is refuted by Applicants' specification, as pointed out in the Request for Reconsideration filed April 26, 2001 [Paper No. 5]. For example the specification describes the surprising and unexpected results obtained by using a ketene dimer and a surface active agent in making soft absorbent tissue paper, particularly with respect to the measured water absorbency rate:

Typically, tissue made without the use of sizing agents shows an absorbency rate test of from about 1 second to about 10 seconds or slightly less. Towel made without sizing agents will typically show an absorbency rate of about 1 to about 50 seconds. When tissue and towel are sized with a ketene dimer sizing agent it can be anticipated that sizing levels, or water resistivity, will substantially increase. For example, absorbency rate tests for tissue can increase as much as 25 seconds or more. Tissue having improved softness from the use of ketene dimer sizing agents in conjunction with surface active agents remain hydrophilic, having a very low resistance to wetting, i.e., they are not sized and thus wet easily. The water absorbency rate test for such softened sheets are

from around 1 to around 4 seconds, but may be up to about 10 seconds or more depending on the type of paper, basis weight and other physical characteristics of the sheet. [Specification, p. 10, lines 5-17]

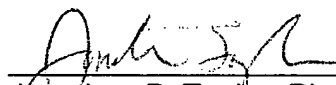
In view of the complete lack of evidence of any suggestion or motivation to provide each and every element of the claims, and further in view of the disclosure related to these elements in Appellants' specification, the present claims are not obvious under 35 USC § 103 over Voigtman or Donnelly, alone or in combination.

5. Conclusion

The cited references, either alone or in combination, do not provide a valid basis for a *prima facie* obviousness rejection of the present claims. Accordingly, Appellants submit that the present invention is fully patentable over Voigtman (U.S. Pat. No. 2,996,424) or Donnelly (U.S. Pat. No. 3,014,832), alone or in combination, and the Examiner's rejection should be REVERSED.

Respectfully submitted,

3/17/03


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APPENDIX

Claims 1-22 are pending.

1. A soft highly absorbent tissue product comprising long paper making fibers, a surface active agent, and a ketene dimer sizing agent.
2. A soft absorbent paper tissue product comprising paper making fibers and at least about 1 pound of a ketene dimer sizing agent per ton of paper product, the tissue having an absorbency rate of less than about 10 seconds.
3. The paper product of claim 2 in which the product comprises three layers.
4. A soft absorbent tissue sheet comprising: a first layer and a second layer; the first layer comprising predominately long paper making fibers and the second layer comprising predominantly short paper making fibers; at least one of the layers further comprising a ketene dimer sizing agent and a surface active agent; and the layer comprising the ketene dimer and surface active agent being wettable by water.
5. The soft tissue sheet of claim 4, in which the sheet is creped.
6. The soft tissue sheet of claim 4, in which the sheet is through dried.
7. The soft tissue sheet of claim 4, in which the absorbency rate is less than about 10 seconds.
8. The tissue of claim 4 in which the tissue sheet comprises a third layer.
9. An absorbent paper sheet having improved softness comprising: a first sheet surface and a second sheet surface; a layer comprising paper making fibers; the layer having a surface; the surface of the layer corresponding to a surface of the paper sheet; the surface of the layer having a ketene dimer sizing agent therein; the surface of the sheet having a surface active agent therein; and the wettability of the sheet being equivalent to a sheet of the same composition but not having the ketene dimer sizing agent therein.

20. The method of claim 18, in which the ketene dimer sizing agent is combined with the paper making fibers after the removal of water from the aqueous slurry.

21. A soft highly absorbent paper product comprising a blended base sheet, a ketene dimer sizing agent, and a surface active agent.

22. The soft highly absorbent paper product of claim 21, in which there are at least 1 ½ pounds of the sizing agent per ton of paper product, and the product has a water absorbency rate of less than 10 seconds.



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